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ARCHITECTURAL GARDENS OF ITALY.*

A REVIEW BY H. VAN BUREN MAGONIGLE.

(Continued.)

PART II illustrates fourteen villas; two at Rome, one at Frascati, one at Verona, two in Lago Maggiore and the remaining eight in Florence and its environs. From the southern Slope of the Alps, across the great plain of Lombardy and the Apennines to Tuscany, and thence to the Roman campagna and the Alban Hills beyond, is a long flight over landscapes of varied and wonderful beauty. One should, I think, in studying these foreign gardens, bear in mind the particular setting of each — for one finds in retrospect that what one has seen beyond the terrace wall of a given villa is quite as clear a memory as what has lain within it. It is impossible for me, at any rate, to dissociate from the Villa Medici the view from the Pincian over the Eternal City to Angelo's dome, nor that of the campagna, dappled with cloud shadows, rolling away from Tivoli or Frascati to the horizon and dominated in spite of its vastness by that mighty work of human hands. Nor from the villa-crowned heights of Fiesole across the purple roofs of Florence and that other dome, Angelo's inspiration and some say, despair, to the cypress-pricked hillside of San Miniato.

It cannot be less the inspiration of the Villa Medici itself (Plate No. 69) than that of the panorama from its walls, which is felt by the *pensionnaires* of the French Academy. One is conscious of it everywhere in the gardens. The space in front of the Casino, although it looks rather desolate in the plan (Plate No. 6), is really not so (Plate No. 70). The main building and the long wing to the south continued by the Loggia (Plates 71 and 72), are cleverly placed to shade it from the afternoon sun. To the north lies a tract subdivided into sixteen parts bounded by high hedges, and overhung by trees so thickly that the paths are a series of shaded alleys. To the south of the Loggia and beginning at the level of its roof (treated as a terrace promenade), is quite a little hill, apparently artificial in part, covered with a dense ilex grove (Plate No. 71), and crowned among the tree tops by a Belvedere.

On the other side of Rome lies the Villa Bel Respiro or Pamphily-Doria as it is better known, covering a vast tract of undulating land not far from St. Peter's. (Plate No. 79).

The levels are managed with great skill. It is especially interesting to note how from the rear the main body of the casino is made to look but two stories high (Plate No. 82) even at a greater distance from the terrace wall, although it is actually three (Plate 81). The terrace steps, a double staircase with a fountain between, are very fine and have huge terra cotta pots, on the balustrade piers, of specially good design.

A careful study of the general plan (Plate No. 78) is well worth while.

The little Giardino Guisti at Verona is hardly great enough in area to make one of the bosquées of the Bel Respiro. Placed partly on the escarpment of one of the hills through which runs the Adige and partly on the level at its base, it has a character all its own. It is filled with magnificent cypress trees, and their dark spires sound a distinctive note. We have not here to consider the placing of the Casino in relation to the garden plan. The palace front faces on the narrow city street, and the garden merely extends to the rear and right of it, with a gate on the principal axe, giving on the street (Plate No. 89). The plan is very simple as befits so small a space, and the paths that ascend the hill are arranged to give charming glimpses of the garden until a terrace at the top is reached from whence Verona lies at one's feet; the river winding between the old brown walls, and far beyond the pale violet of the Brescian Alps.

An horizon closed to the north by snow-clad peaks. To West and East and South the foothills melting down to the plains of Lombardy. All about, the waters of Lago Maggiore, indescribably blue, lapping the water stairs of the Villa Borromeo on Isola Bella. Such a site would lend distinction to any garden, and reminds one irresistibly of humbler but not less lovely ones in Capri. There, as here, water and sky and air lose the relations they have in our North, and are transmuted by some alchemy of the sun into mere translucent color. All that is needed is a formal frame to establish the human relation, the milieu. And one would be content with a less elaborate one than we have in the Borromeo.

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* "Architectural Gardens of Italy." A Series of Photogravure Plates from Photographs made for and selected by A. Holland Forbes, Editor of Architecture. In three portfolios. Limited to seven hundred and fifty numbered sets. Subscription, $37.50. New York: Forbes & Company, Ltd., 160 Fifth Avenue.

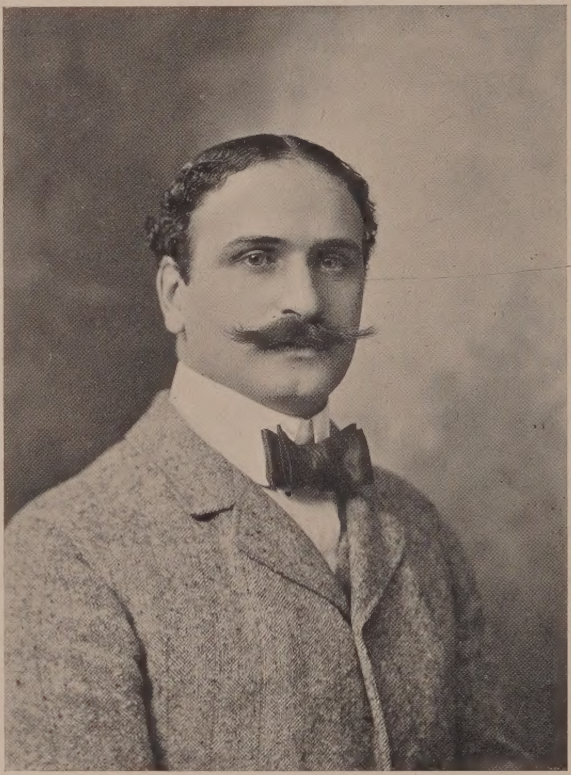
The terraced Mount (Plates 94 and 95) is certainly interesting, though one feels that the statues, posturing in the presence of the eternal Alps, are not only impertinent but disconcerting.

The rocaille almost rivals that in the Vatican gardens in its depressing ugliness (Plate No. 98). These are minor matters, but where Nature has been so kind, man should not be ungrateful; and such evidences of his bad taste offend more here perhaps than in some less favored spot.

There is a notable contrast between this villa and the Boboli Gardens. The one terraced up the steep sides of its island, commanding a wonderful prospect — the other cupped in a fold of the hill below San Miniato, frowned upon by Michel Angelo's bastions upon the one side and confronted by the huge bulk of the Pitti upon the other. Shut in upon every hand, with no outlook whatever, there is an intense feeling of privacy and seclusion about the place.

It is natural, where the gardens are an adjunct of a great palace like the Pitti (Plate No. 103) to look for a large unplanted area near or about it. Scale demands it, and when the building is so important it is necessary that it should be completely seen. And in the amphitheatre (Plate No. 104) we find a splendid and dignified treatment of this space, where a natural basin in the hillside was converted into a court in which fêtes were held. All around this is a network of alleys through thickets of ilex, whose branches meet overhead and scarcely let the sky be seen. These green tunnels are delightful on a hot day (Plate No. 103).

There are some of the tallest and finest hedges to be found in Italy, especially around the Water Garden (Plate No. 107). Some of the fountains here are charming, silhouetted against the deep green of the trees. There is a beautiful vista, a long straight alley flanked by cypresses descending from one high point to the Water Garden and rising again beyond it. Everywhere is the evidence of the designer's skill in taking advantage of the natural conformation of the ground, and adaptation of the means to a magnificent end.



Architects of To-day—XI.

MR. J. H. FREEDLANDER.

The other villas, dotted about on the heights above the city, are of minor interest. The Villa Castello has among other excellent things a fountain and terrace wall of unusual merit (Plate No. 119), and the Villa Palmieri is famous as the scene of the Decameron. Plate No. 126 shows the palazzo and gardens, and gives besides a glimpse of the incomparable hills of Tuscany.

(*To be continued.*)

THE following is a list of the Committees of the Architectural League of New York, for the years 1902-1903: Current Work—Chairman, R. Hinton Perry, J. H. Freedlander, R. H. Hunt; Catalogue—Chairman, W. W. Kent, A. R. Ross, Louis Rhead; Exhibition—Sub-Comm. Archt. Chairman, J. Langdon Schroeder, John Galen Howard, Stevens Haskell; Sub-Comm. Dec. Chairman, J. Wm. Fosdick, Augustus Lukeman, George W. Breck; House—Chairman, Horace Moran, A. R. McKim, Geo. Martin Huss; Competitions and Adwards—Chairman, C. C. Haight, Howard Russell Butler, Herbert Adams; Library—Chairman, Wm. B. Tuthill, C. W. Romeyn, C. A. Gifford.

THE following is a list of Officers and Committees of the Brooklyn Chapter of the American Institute of Architects, elected at the annual meeting, held at the Clarendon Hotel, Borough of Brooklyn, N. Y., September 22, 1902, for the years 1902-1903: President, Mr. J. M. Hewlett; Vice-President, Mr. A. G. Thomson; Surveyor, Mr. Frank H. Quinby; Treasurer, Mr. H. Hobart Weekes; Secretary, Mr. John Petit; Board of Directors, Messrs. Louis DeCoppet Berg, R. L. Daus, Washington Hull, I. E. Ditmars, A. V. Porter, Charles T. Mott and W. A. Strout, J. F. Harder, Juniors; Exhibition Committee, Messrs. Hedman, Hull, Mott; Membership Committee, Messrs. Mott, Quinby, Griffith; Social Intercourse Committee, Messrs. Werner, Glover, Walter Parfitt; Committee on Legislation, Messrs. Hull, Porter, Harder; Current Work Committee, Messrs. Dehli, Thomson, Porter; Professional Practice Committee, Messrs. Griffith, Dickson, Hull; Surveyors Committee, Quinby, Hedman, Porter: Delegates to Fine Arts Confederation, Messrs. Hewlett, Ditmars, Weekes; Alternates, Berg, Hull, Griffith; Delegates to Annual Convention, Messrs. Hewlett, Thomson, Daus and Weekes; Alternates, Porter, Quinby, Petit, Glover.

THE settlement of the strike of painters on the White House addition, removed, it is hoped, the last obstacle in the way of speedy completion of the work. Certain newspapers are pitching into the design, as "mean looking," but before final judgment is passed the public should wait until the building is finished. It is hardly to be supposed that the design has been carelessly made, either architecturally or otherwise, as it is the result of a determined effort to prevent other and more extensive alterations of a radically different sort being carried out. These, it was claimed, were not architecturally or practically proper. If now the result is a failure it will be a surprise and a disappointment to all lovers of architecture, irrespective of their feeling as to who should have made the design. This, although a small operation, is one of vital interest. It will, if bad, damn the present Executive Mansion and grounds architecturally, and, incidentally, those people who are responsible for it.

On the other hand, if it is a successful wing or addition, it will be a source of constant congratulation that the old house is so little disturbed. It is hoped and believed that it will be the latter, and a few months will tell. So far, however, there has been a strange absence of comment from architectural journals on this building, as finally undertaken.

IF, AS reported, Mr. de Koven is to succeed in establishing a school for American light opera in connection with a building for its representation, the time has come for all New Yorkers to ask whether it will not be possible to have a theatre front designed which will be the Real Thing architecturally, as George Ade might say. Have we ever seen any decent theatre design in New York? It is doubtful. From the noble storage warehouse, known to Grand Opera patrons, down to the Chinese colony playhouses, we can hardly say what the facades mean or why they are so. We hope that Mr. de Koven will be collected and slow in selecting his architect. We really have many good ones in New York and he knows it, therefore we ought to get a design as good as the Comique in Paris, and yet we may express the modest hope that it won't be Parisian. Mr. de Koven is a delightful composer of light opera, and the opera-going public could with propriety say to him, "Oh, promise me that some day you and I" will hear not only delightful music inside the new temple, but that its exterior will actually suggest what is expected to take place inside.

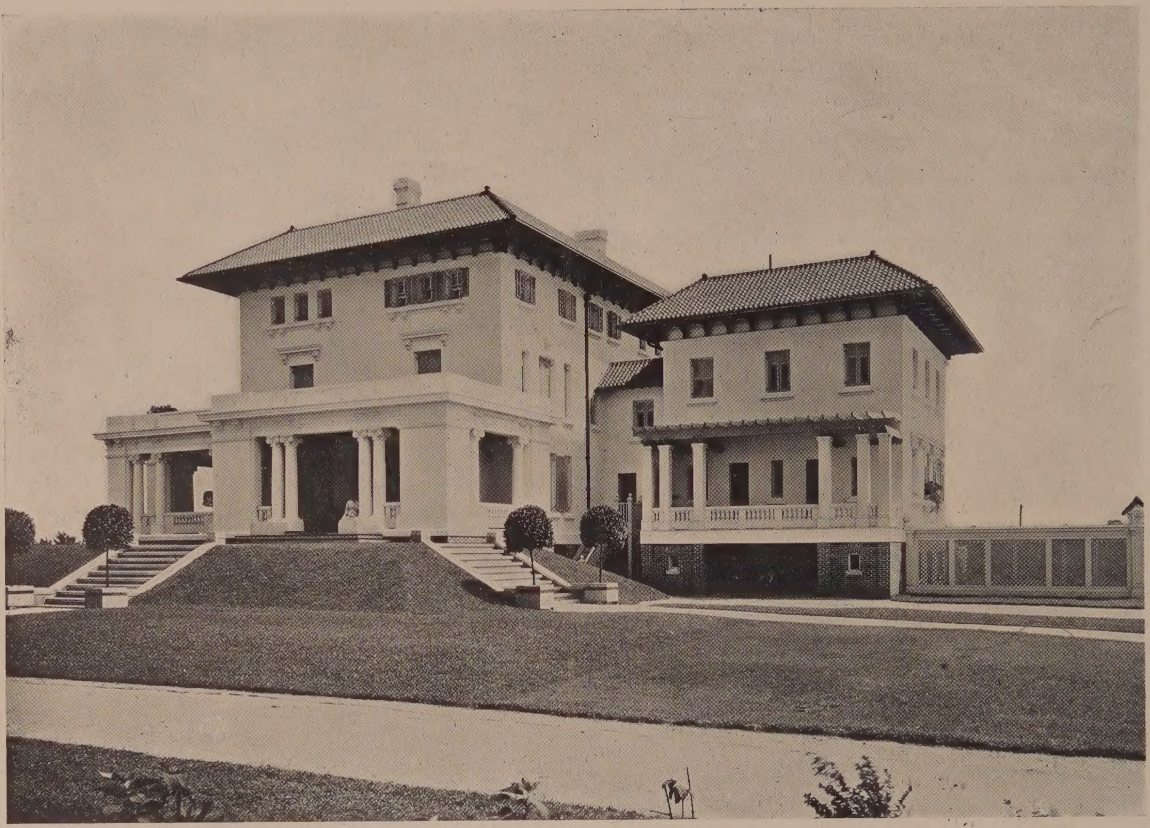
A CORRESPONDENT of the London Globe states that no measured drawings of the fallen Campanile are in existence. This may be a fact, but it is doubtful until proved. The same statement has been made before and so far not openly challenged. To a layman, this seems possible, but to an architect it seems almost impossible that one of the most famous towers in the world should have escaped the zeal of at least the measuring architectural student, and if the question were openly put to the profession universally, the chances are that some one would be discovered with measured drawings in his possession. It is certainly a pity that the Italian, or at least the Venetian officials, did not have measurements taken when the settlement and cracking were first noticed. Is there no American who has data of the old structure? Any measurements would be valuable, and if we could from America send to them what they lack, what an horror, what a real "invasion!" The question as to whether the old design or the new one should be built is a debatable one, and each side has eminent champions. It is easily the most important architectural question of the day, affecting, as it does, so many historic buildings. Before a new design is decided upon a vast amount of study and consideration is in order and, on the whole, the rebuilding of the old tower is safer provided enough old material remains to give substantially the same effect as before. In our opinion, a new design should not be attempted without a carefully conducted competition, in which the relation of the tower to St. Marks, the Doge's Palace, the Library and other less important buildings should be primarily considered.

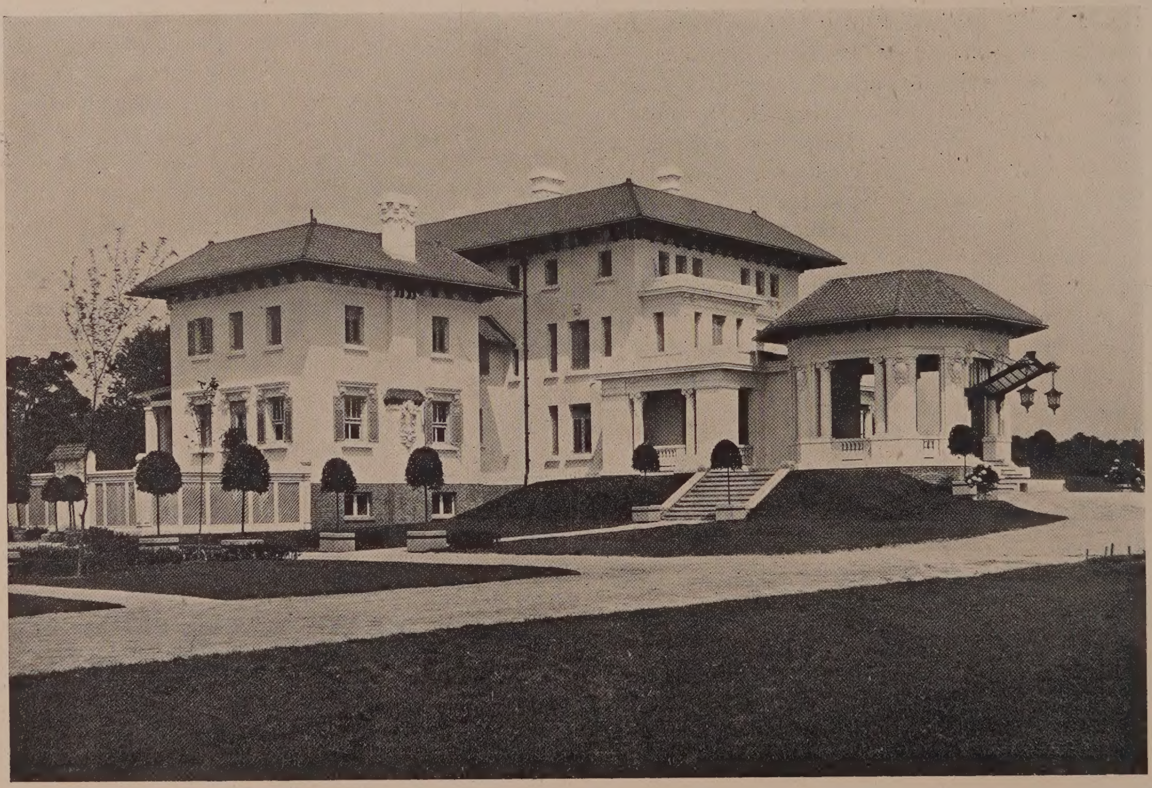
THE much discussed monument to the Pilgrims at Provincetown, Mass., seems now on the road to realization. It is proposed to spend $50,000 in marking this hitherto neglected sight of the first landing although as the exact sight is not known, the monument will probably go on one of the hills, now used as a town reservation or lookout. The amount available will not admit of an exuberant expression in stone of what Massachusetts, and America, owe to the courage of Pilgrim convictions, and a simple mass will best suit the site and the character of the deed it commemorates.

AT THE annual meeting of the Pittsburg Chapter, American Institute of Architects, the following officers were elected: President, C. M. Bartberger; Vice-President, T. D. Evans; Secretary, George I. Orth; Treasurer, Olaf Topp. These officers, with Messrs. Chas. Bickel, F. A. Russell and C. J. Ingham, constitute the Board of Directors.

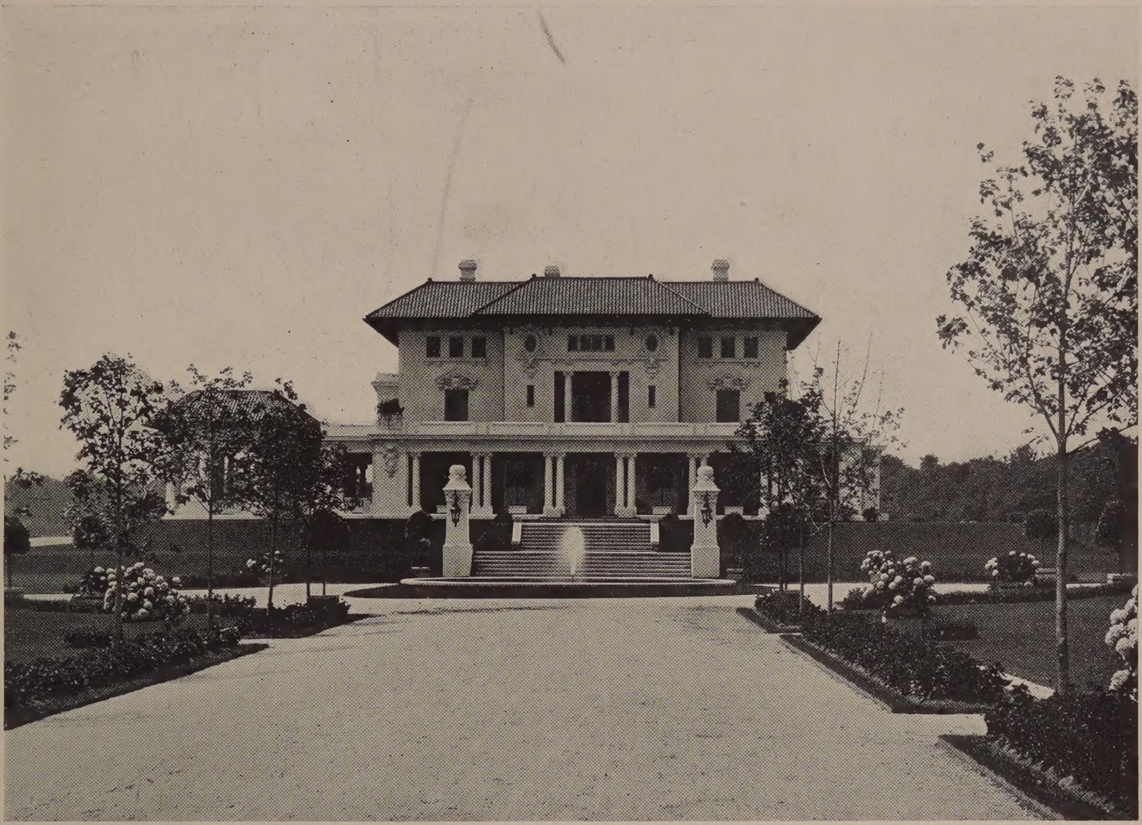
IT IS to be regretted that the energy and activity for which Pittsburg business men are noted has not manifested itself in the Board of Trustees and Councilmanic Committee whose duty it is to secure a site for the Carnegie Technological School. The money for this institution was donated two years ago and the committees are still discussing the merits and demerits of several available sites with a tenacity that indicates an indefinite continuation. With the Carnegie Institute extension held up in the courts and the Technological School lacking a site, the chances are that the eager public will not reap the benefit of Mr. Carnegie's generous donations for some time.

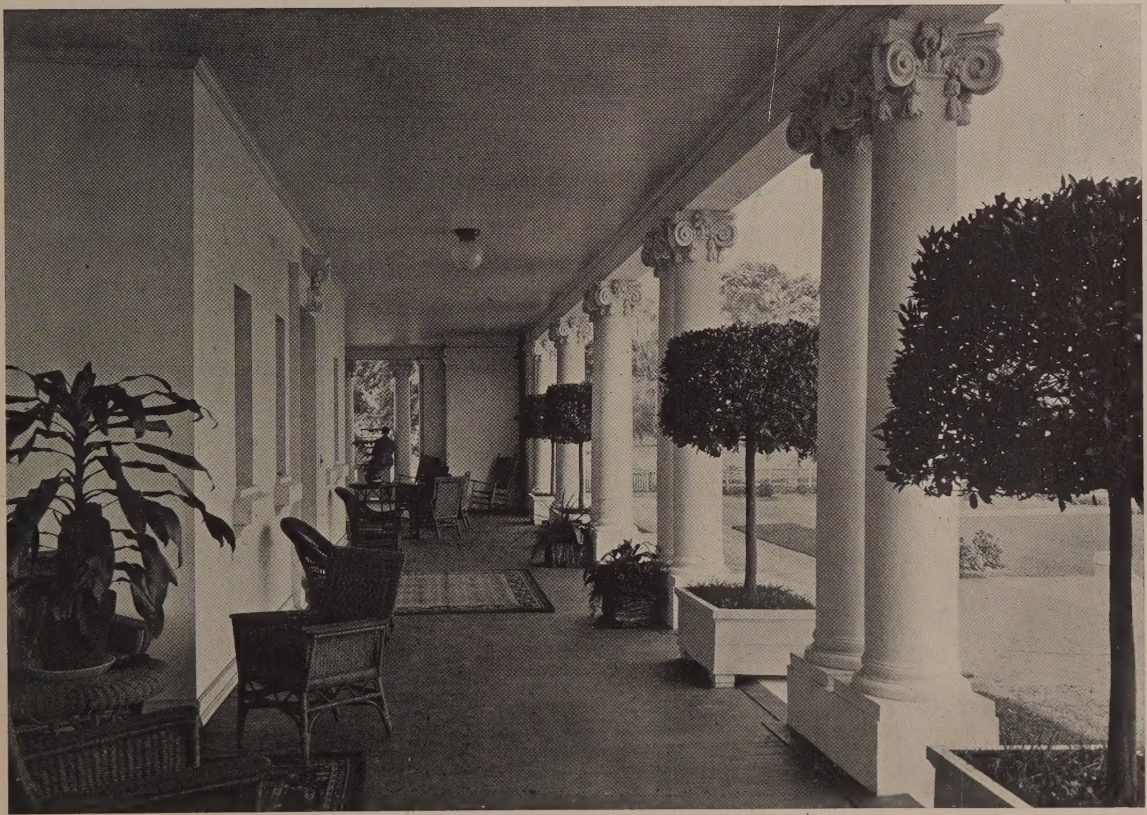
THE preparation of sketches for an employer contemplating building is a usual and fairly reliable means of representing the effect of a design. It may not be the most judicious in some cases, as, for instance, when the client is a person incapable of making up his own mind, or when any attempt is made to exaggerate or add to the effect by tricky sketching to captivate a person not able to understand drawings. For, curious as it may seem, there are some persons quite incapable of interpreting drawings, however clear—who have a sort of visual blindness in apprehending the conventional methods in use, such as those of plans and elevations and even perspectives. Many architects must have come across people of this kind, who can understand a model or a building erected, but who cannot realize the effect of a perspective view. But with the majority of people a sketch is a more popular way of showing what is intended than a set of plans and elevations;—it is better understood, as it represents the building in the solid with its main fronts in due relation to each other; it is also an easier way of appealing to the employer's taste, and it saves the architect the labor of preparing a set of drawings at once. But, for some reason, the employer thinks that a sketch is not worth paying for, if he changes his mind. An architect is asked to give a plan for building, say, a country house. The requirements are roughly stated by the employer, and the architect proceeds to prepare plans in pencil, and sketches to a small scale. These are sent to the client, who wishes a few alterations in the plan. They in turn are made, and another set of plans and sketches are sent to the employer, who thinks they will do; but in the meantime he wishes the architect not to proceed with the drawings till he has made up his mind as to the site. The architect waits patiently for some months, and writes again, to hear that his client has got a builder to erect a house that will suit him. But the sketches made are not returned till after a request has been made. The end of it all is, that the employer has surreptitiously used the ideas in the building he has erected with the aid of the builder, and refuses to pay for sketches that he says have been of no use. Such a case has occurred again and again.



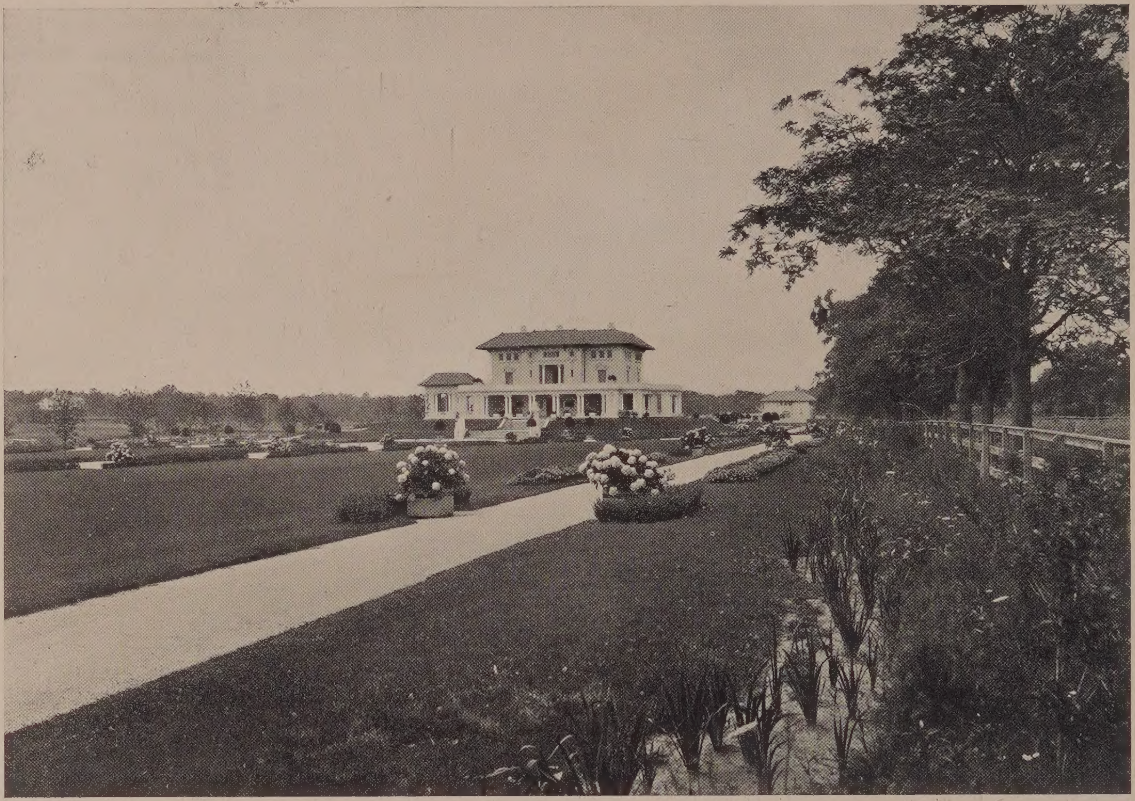


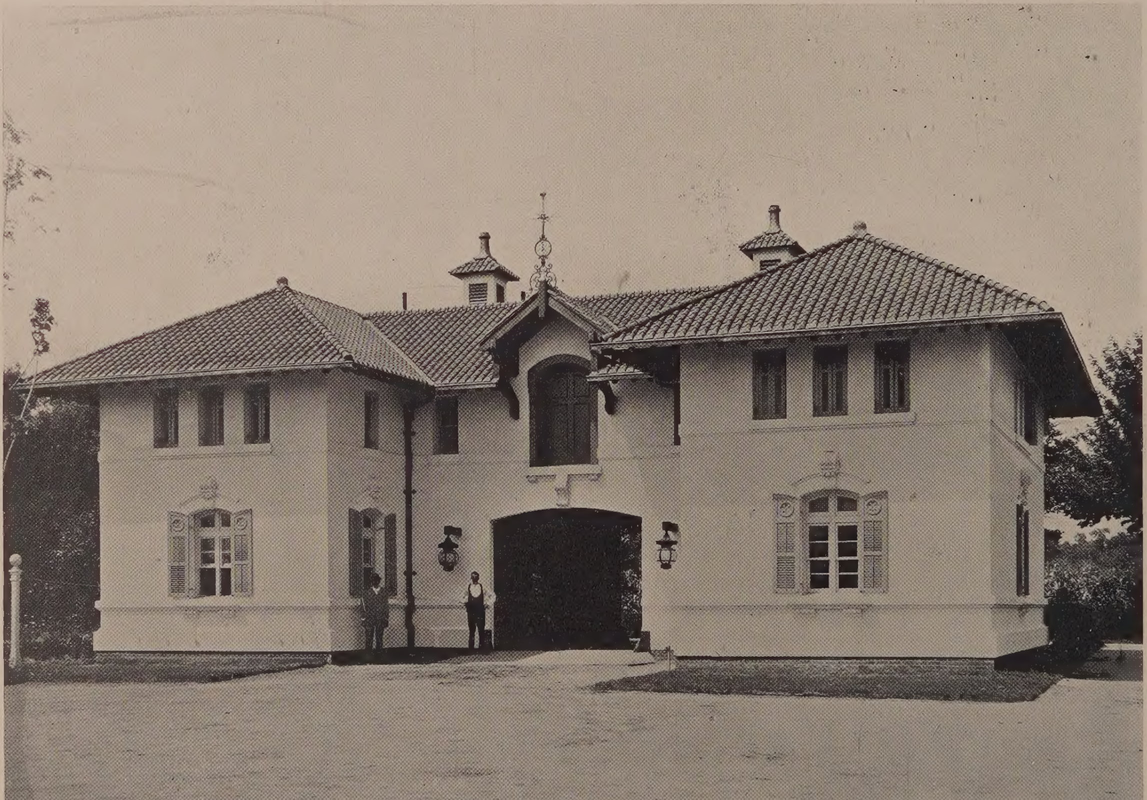
NORTH AND SOUTH VIEWS, "ELLENCOURT," RESIDENCE, S. SACHS, ELBERON, N. J. J. H. Freedlander, Architect. Wurtz, Photo.



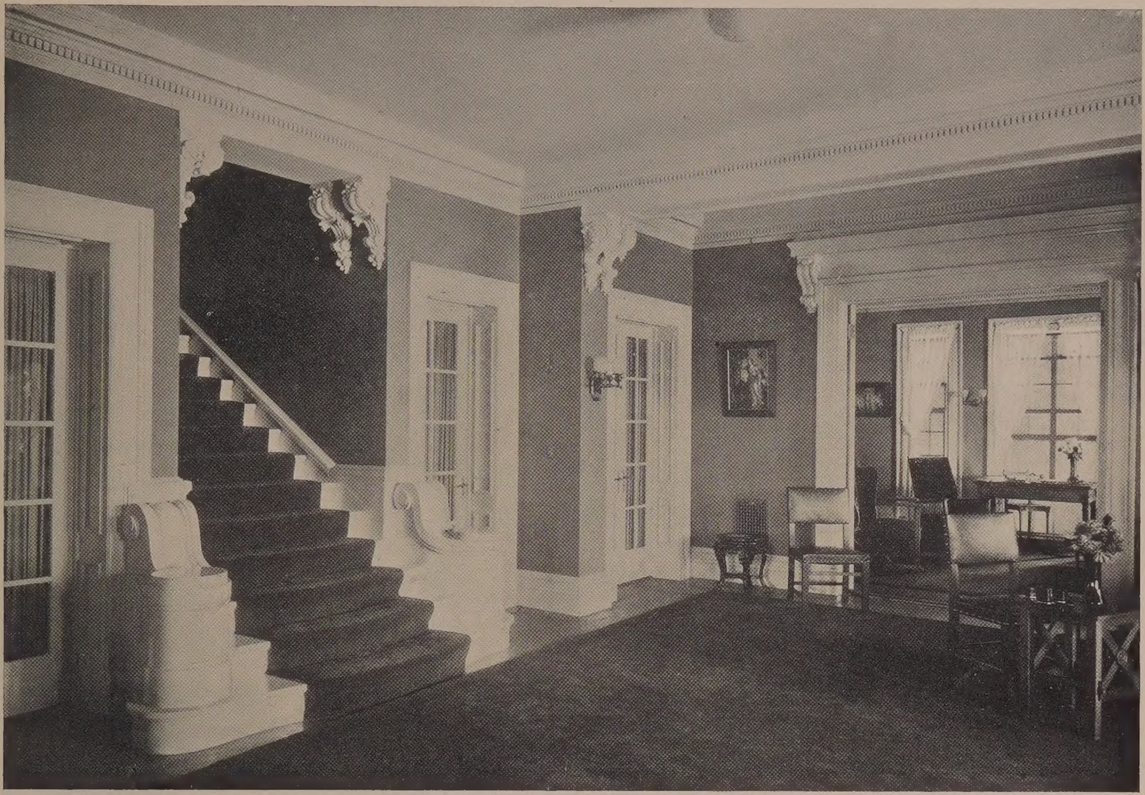


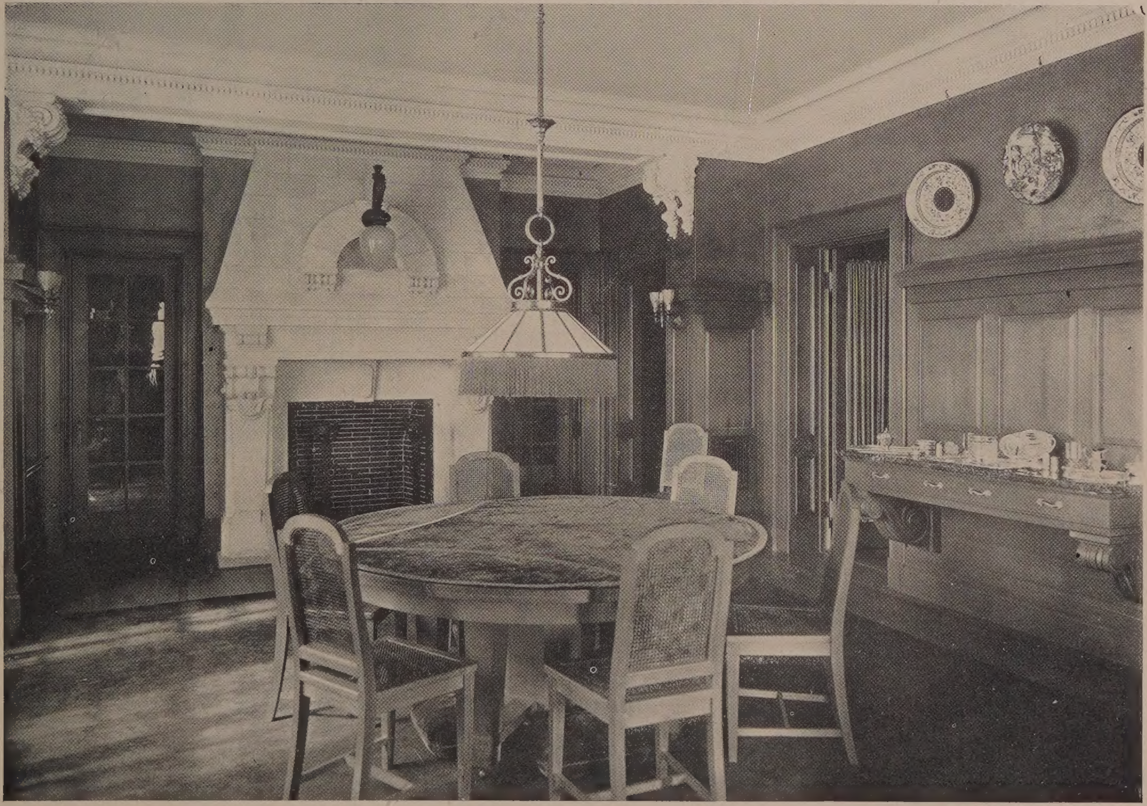
MAIN FRONT AND VERANDA, "ELLENCOURT," RESIDENCE, S. SACHS, ELBERON, N. J. J. H. Freedlander, Architect. Wurtz, Photo.



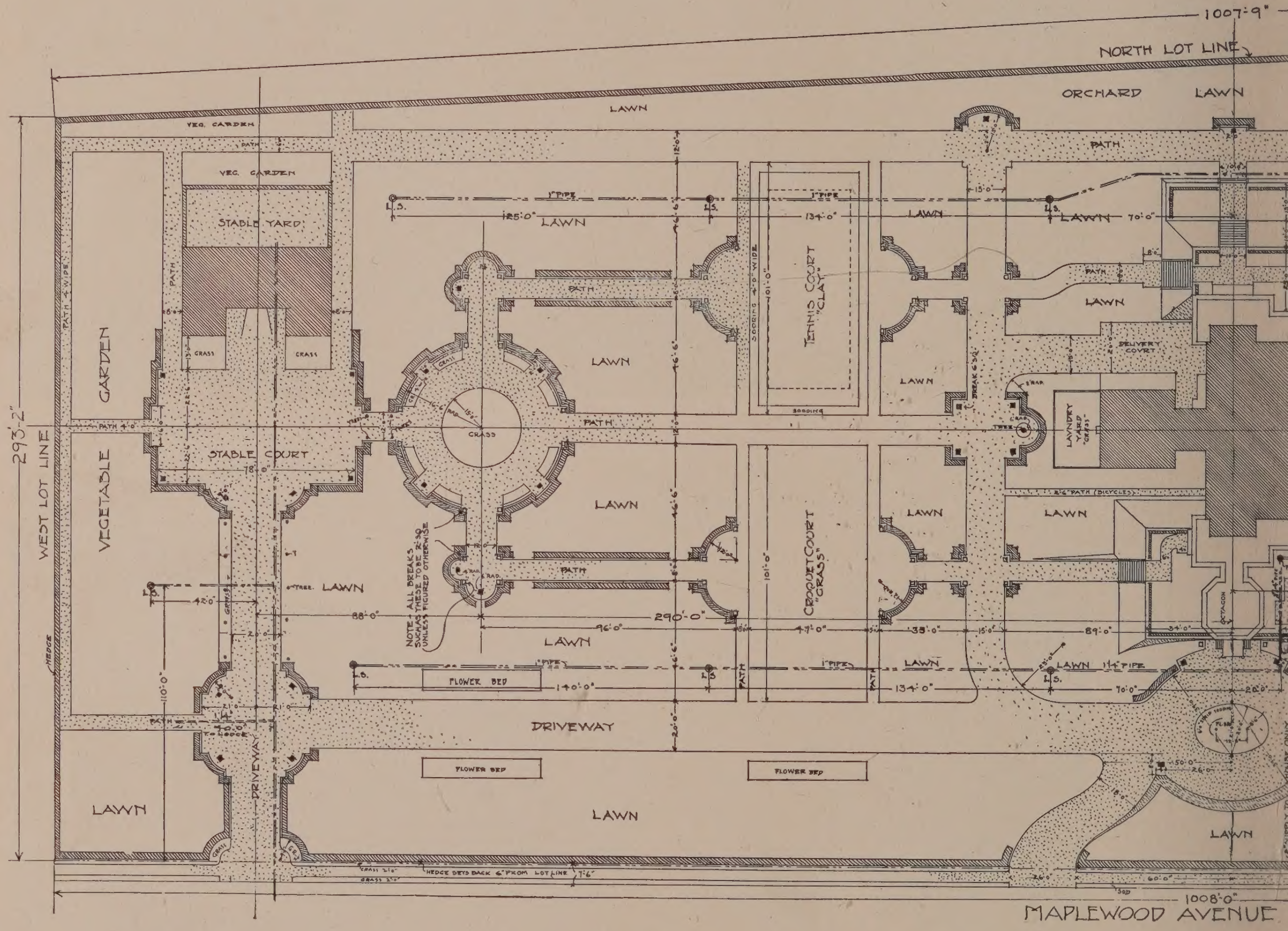


GROUNDS AND STABLE, "ELLENCOURT," RESIDENCE, S. SACHS, ELBERON, N. J. J. H. Freedlander, Architect. Wurtz, Photo.

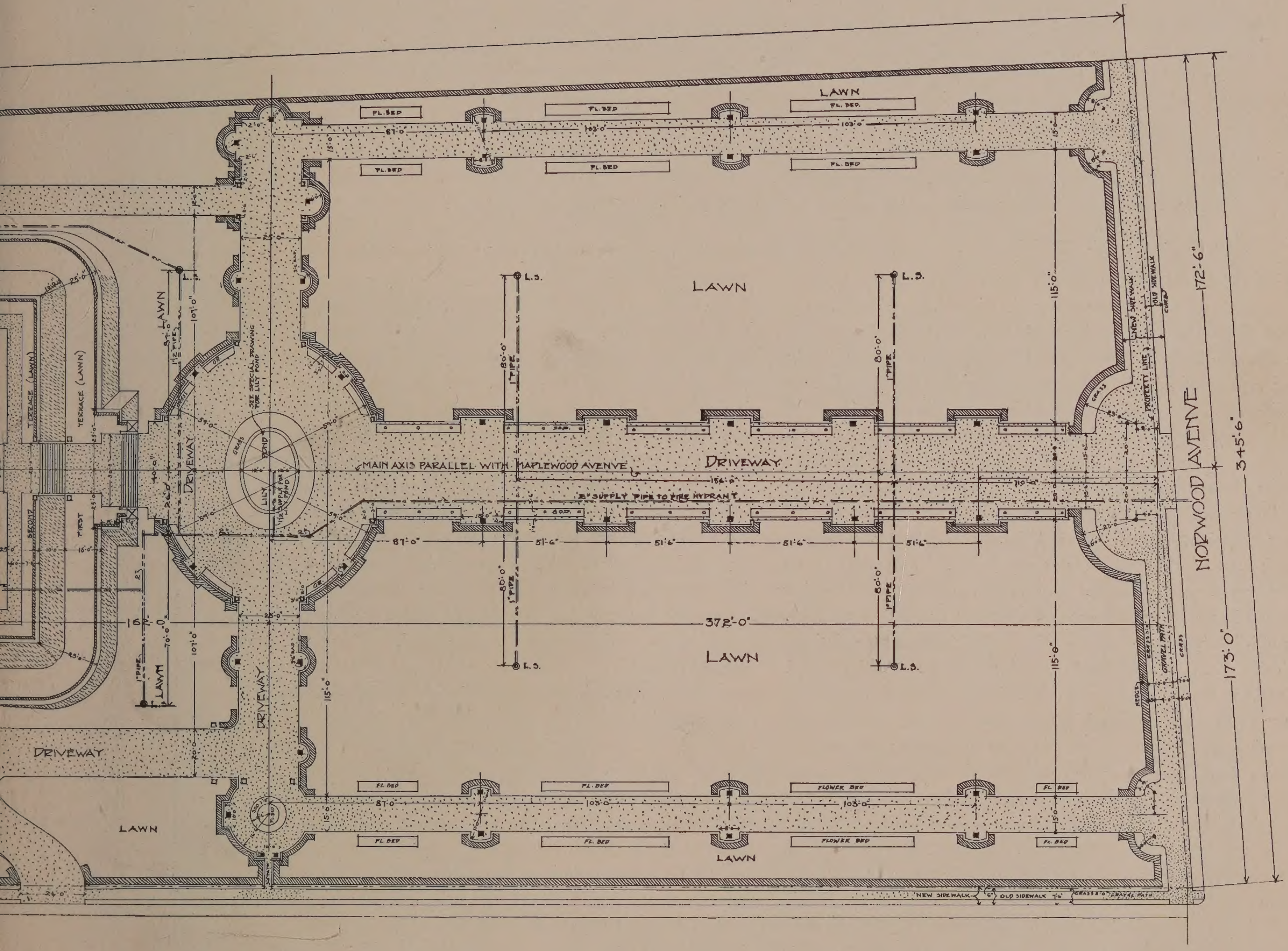




HALL AND DINING ROOM, "ELLENCOURT," RESIDENCE, S. SACHS, ELBERON, N. J. J. H. Freedlander, Architect. Wurtz, Photo.



PLAN OF GROUNDS, “ELLENCOURT,” RESI



. SACHS, ELBERON, N. J. J. H. Freedlander, Architect.

In another instance, the client, after receiving the sketches, places them in the hands of a friend, who builds a house on similar lines. The sketches are ultimately returned to the architect with thanks. One use to which the sketch design is often pu s to advertise a company, a new theatre or public building, a row of shops and offices, or to attract tenants to a new estate. In this manner, also, the architect is often the victim. He is led to put the ideas of the client or company into shape, to formulate a new scheme for, perhaps, a row of shops, or an arcade;—a design or sketch is as necessary as the prospectus. The architect prepares a sketch plan and view ; these are at once adopted, and ordered to be lithographed or reproduced by photo process. The work entails thought in the planning, and much artistic skill in the perspective view, which may be colored or in plain lines. After considerable efforts have been made to float the company, the scheme collapses : the shares are not taken up, and the services and skill of the architect are repudiated by the promoters of the scheme. Thus it is the architect's services are thrown away, unless he has made some special contract with those who have instructed him.

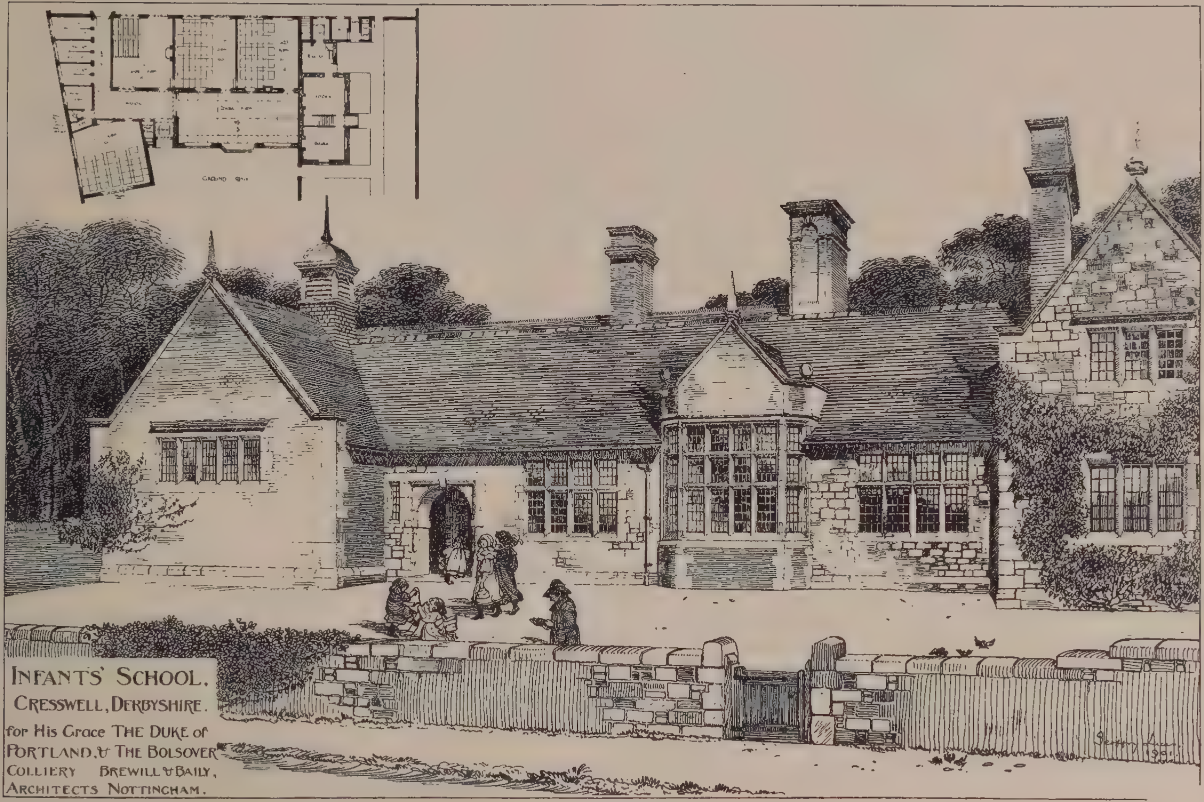
MUCH discord and ugliness in our engineering and building works would be obviated if the engineer and architect agreed between themselves upon fundamental principles. As construction is the common basis of both engineering and architecture, we might at least expect to discover some grounds for unanimity, or at least concession. Both professions use the same materials in their structures, and might be expected to find common principles of converting and using them. But even in this initial question there appears to be a divergence of opinion. We find the engineer not scrupulous about using his granite and stone in an almost wasteful manner in great masses of piers and foundations; he treats them as so much inert material unworthy of any design. The architect, on the contrary, breaks the masses up, distributes them in piers or other parts, and impresses an architectural character upon his stonework. Tons of brickwork are placed in bridge abutments and foundations, which the architect would seek to render effective and decorative. One seeks to use his masonry as a counterpoise or dead-weight; the other to mold it and arrange it for the same purpose. The engineer of a work looks at stone and brick as inert dull matter; the architect as capable of embodying other attributes—of being impressed with mind and character. Even iron, in the hands of the engineer, is treated in the same soulless manner: it is used to resist tension in rods and bars, cross-strain and crushing in shaped sections, without any other consideration of fitness. In fact, the difference between the engineer's and architect's conception of material is equivalent to saying the one uses material mechanically, the other æsthetically; and this fundamental difference in the mode of use connotes the two conceptions of design. We must refer all the points that arise in question of design about bridge construction and other works of an architectural kind to this root-basis—the use and treatment of material. While material is considered only mechanically, or its physical properties, we cannot expect any design. It is the impossibility of conceiving any material as expressing any function that separates the work of the ordinary engineer from that of the architect. Each of the professions must consider the views of the other. Architects must make themselves acquainted with those principles which the engineer accepts and upon which he works, and engineers must also put on one side their own predilections and come prepared to consider the problem from the architect's point of view. Or the architects must study the engineering of the subject, and become masters of the constructional problem, so as to put forward their own claims in an intelligible manner, instead of, as too often, ignoring the engineer's design and proposing something that is based on preconceived views. In this way only —that of mutual compromise and concession—can any improvement be made possible.

MODERN DEVELOPMENTS IN BUILDING.

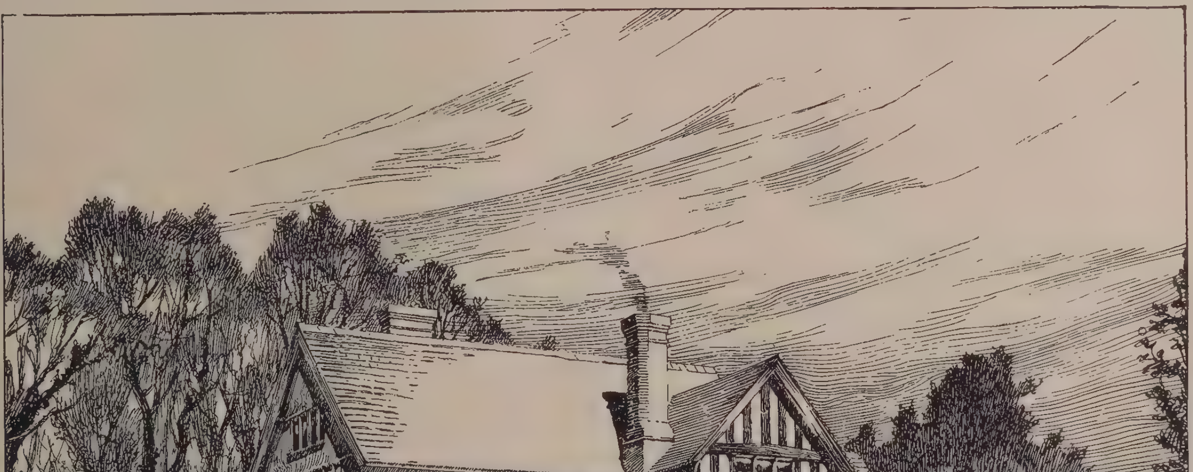
J. H. HASTINGS.

FEW will deny that we are passing through an experimental stage in our building and art, in the wider and more numerous applications that the architect has to meet, as well as in the progress of legislation as it affects building. No one can dispute the artistic and constructional evolution that is taking place. For the last thirty years, at least, we have been copying, pulling to pieces, analyzing every phase of ancient art, and we are now engaged in formulating a new architecture, the conditions of which have immensely changed. Amongst these the result of competition stands first in its effect on building and the architect—the desire to erect cheap buildings and to obtain the best talent at the lowest price; next in importance is the wider application of building to numerous purposes unknown half a century ago; third, its absorption of new materials and new systems of construction, its enlistment of engineers and other experts; and, lastly, the greater demands of town life. It will be impossible to show in one article how each of these causes has operated to alter the conditions of modern building.

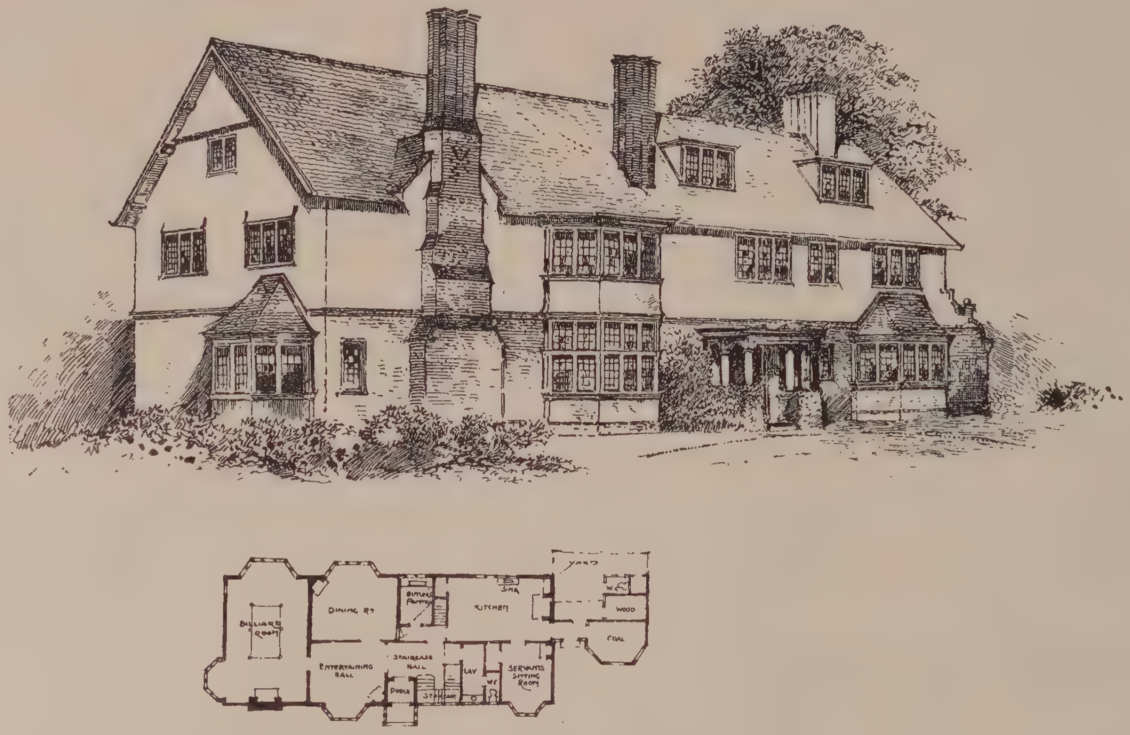
Two or three decided developments of these conditions have to be faced by the modern architect. One is the importation of the engineer and foreign elements—the development of specialism. We have lately shown the extent to which engineering in several branches has entered building construction in the form of heating, lighting, ventilating, and electric-power machinery, and to what extent the architect has to plan and design his large buildings to adapt them to these several requirements. The combination of structural work with installations of a more or less mechanical kind has considerably enlarged the architect's sphere of duties, while it has obliged him to be conversant with the scientific principles involved in heating, ventilating, lighting, electro-motive and hydraulic agencies in the development and transmission of power. In the design and construction of our large city buildings, hotels, and blocks of offices and flats the engineering features bulk largely. We have not only deep and costly foundations, involving piling, pneumatic caissons, forming watertight dams as well, and pumping appliances, but steel frames, fire-resisting floors and roofs, hydraulic and other lifts, heating arrangements, ventilating appliances, electric lighting, and other things. In our high buildings the construction involves twenty to twenty-five stories or floors, which, with their loads, are carried on the steel frames that also support the exterior walls. The modern steel skeleton structure may probably in a few years take the place of the solid brick walls of our city buildings. These exterior solid walls encroach largely on the area. The steel skeleton, on the contrary, occupies a small area of the floor space, and supports the total weight of the entire structure and its several floors. These foundation loads are distributed over a large area of concrete and steel grillage, or they may be concentrated at intervals on columns. All this involves a calculation of the loads and the safe resistance at the points of support. In the high-building skeleton the columns require to be carefully calculated, as the loads on



INFANTS' SCHOOL,
CRESSWELL, DERBYSHIRE.
for His Grace THE DUKE of PORTLAND, & THE BOLSOVER COLLIERY BREWILL & BAILY, ARCHITECTS NOTTINGHAM.



DESIGN FOR COUNTRY COTTAGE. T. W. Cutler, Architect.



DESIGN FOR A COUNTRY HOUSE. James Strong, Architect.

the girders or rolled beams are generally supported on cast-iron brackets, or bolted to the columns, or riveted, and these loads are therefore not central with the columns, but require nice calculations to be made for excessive loads. Unless provision is made for these beams in some other way, the columns receive a load that tends to bend them, and therefore their strength for vertically-disposed or axial loads is useless. It will be seen, therefore, for structures of steel framework, the architect must bring to his task a knowledge of stresses induced by eccentric loads, as well as a technical acquaintance with iron and steel. In the Mutual Life Building and the Stock Exchange Building, New York, considerable engineering skill has been exercised in the construction of the pneumatic caissons for foundations which not only carry the walls, but protect the basements from water, and enable them, below the water level, to be used for boilers, storage, or other purposes. We cannot expect the professional architect to master all those duties. They are special qualifications: they imply a knowledge of engineering which few architects can be expected to attain; and the consequence has been the development of special branches of construction. For an ordinary house or premises the architect is expected to know the best system of drainage, but the drainage of a large country mansion or commercial building involves a complex plan, and the services of a sanitary expert may be necessary. Questions of sanitary details involve expert knowledge which was not required in earlier days. And so of many other technical requirements of the modern equipped building, heating and ventilation arrangements, electric lighting and elevators, unknown to the architect a century ago. These matters all tend toward a scientific conception of building, while conditions that favored art are disappearing. Every part and fitting of a building has to be built or designed to suit inventions and apparatus; restfulness and repose are sacrificed to the invasion of modern fittings of elaborate make that are quite foreign to the artist's work. In the course of a few years we may expect to see further improvement in the design and application of fittings and building appliances, a better taste displayed in constructional ironwork, metal fittings, and manufactured articles. At present there is conflict; the architect has to consult engineers and experts, to adjust and to try to mitigate differences and disagreements, all of which leave him little time for art.

Large building operations by companies and syndicates form another development that has much altered the conditions of building in our time. There is a demand for huge buildings for commerce and habitation, in which American milionaires throw in their money and interest. In these operations real architecture is at a discount, unless it takes the form of embellishment. The architect in fact plays a subordinate part: his individuality is lost; he has to consult committees' experts, co-operate with many specialists. All single-heartedness in his work is rendered impossible; he has to produce a building that will compete with others in the same line of business. The whole undertaking is from beginning to end commercial. The directors of the company first advertise for designs in competition, so as to obtain what they think the best design at the cheapest rate. Afterwards they modify the plans, obtain the lowest tender they can, and all through the work, the architect's efforts are mainly employed in cutting and contriving the design, making compromises with engineers and tradesmen. If there is any artistic ability displayed in this design it is soon stifled or suppressed by requirements of managers and officials. There is little honest architecture under these conditions; the personal factor is suppressed or lost, and the exterior is the only part of the design that revels in ostentation of a vulgar or *bizarre* kind. If it is a large shop it is smothered externally by a profusion of features that have no correspondence with the interior; if a hotel, the facade is let to the architectural carver and the apartments to the upholsterer and decorator. The architect's business is really to give opportunities for these and other trades to make a display of their goods; the building becomes a huge advertisement for Messrs. So-and-So, miscellaneous tradesmen, and others whose names figure before the architect's. Really the architect's work has been mainly to obtain a contract and let the work to the various trades— a species of agency unknown to the profession a century ago, when clients employed an architect because of his known abilities, consulted him, and placed the whole line of work in his hands.

There is another aspect of the extent of modern building enterprises: that is the tendency to economize material and labor by the adoption of regulation rules and stereotyped designs. A repetition of a number of unit buildings like workmen's cottages, barracks, hospitals, wards, and the like, is quite a modern departure, quite opposed to the development of architecture and to individual effort. The building speculator who leases land for speculation resorts to the like method of repeating, *ad nauseam*, the plan and elevation of the same house along miles of new streets. In joinery we meet the same repetition of doors and window-frames, and now the question of standardizing iron and steel sections is being considered by our engineers and iron and steel masters.

SOUNDPROOF PARTITIONS.

REPORT OF PROF. CHARLES L. NORTON.

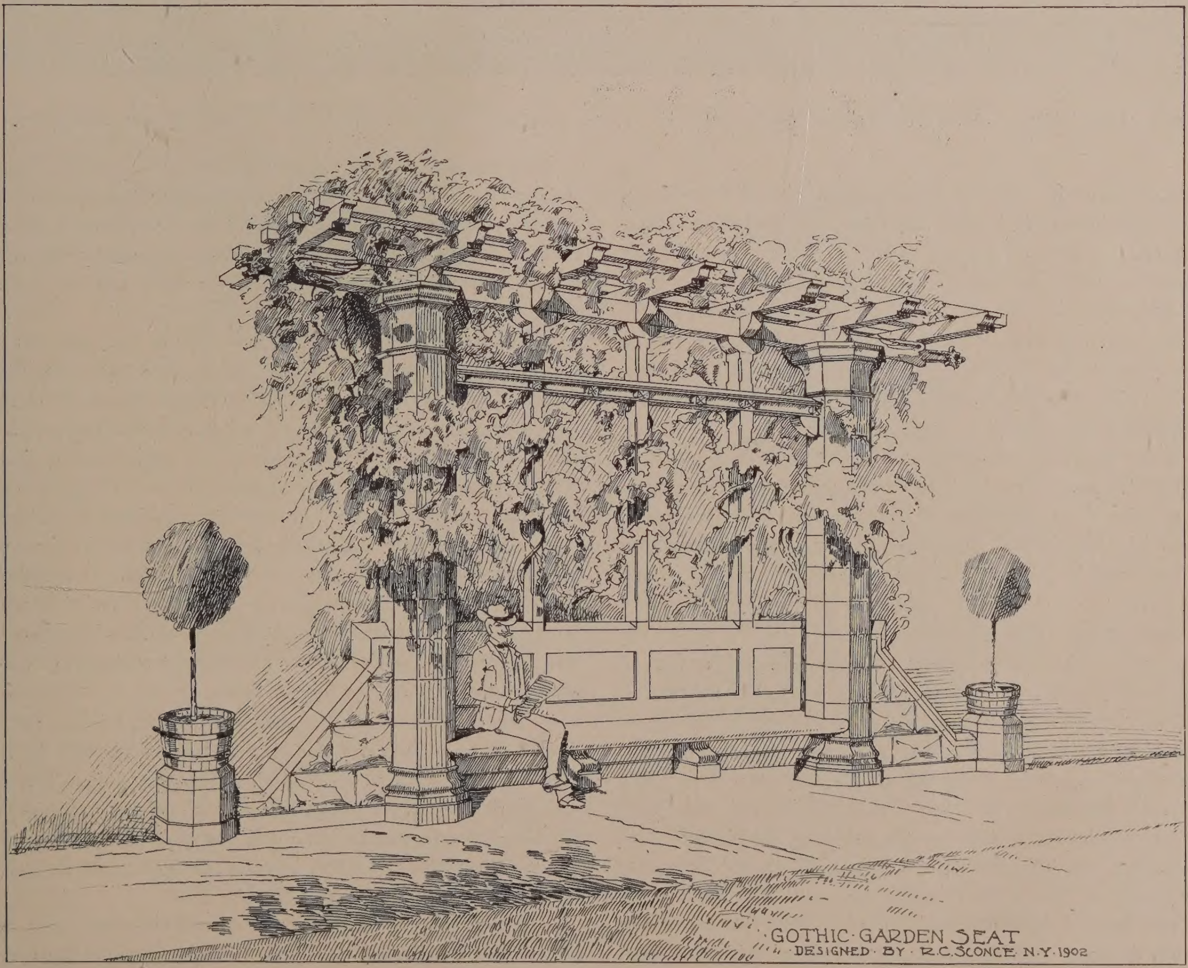
THE subject of partitions for fireproof buildings is one which has led to much investigation, especially by the New York City Building Department.

When it is desired to make a partition which shall be reasonably soundproof, it is apparently necessary to diminish somewhat the absolute incombustibility of the partition, though to a less extent than was supposed.

The following account of tests made for Mr. Edward T. Barker, architect of the dormitories of the New England Conservatory of Music, will show the relative values of some of the typical partitions as soundproof separations between rooms:

There were built upon the concrete floor of the B. & A. warehouse, East Boston, firerooms seven feet square, whose side-walls were made of the several partitions. The rooms were built upon a floor of the same kind as that which is to be used in the buildings for the students of the conservatory, for which the results of these tests were especially desired.

The rooms were built near one another on the fifth floor of the warehouse in a large loft or room about fifty inches by seventy feet long and nine feet high. The ceiling of each room was the under surface of the concrete ceiling of the large room.



·GOTHIC· GARDEN SEAT
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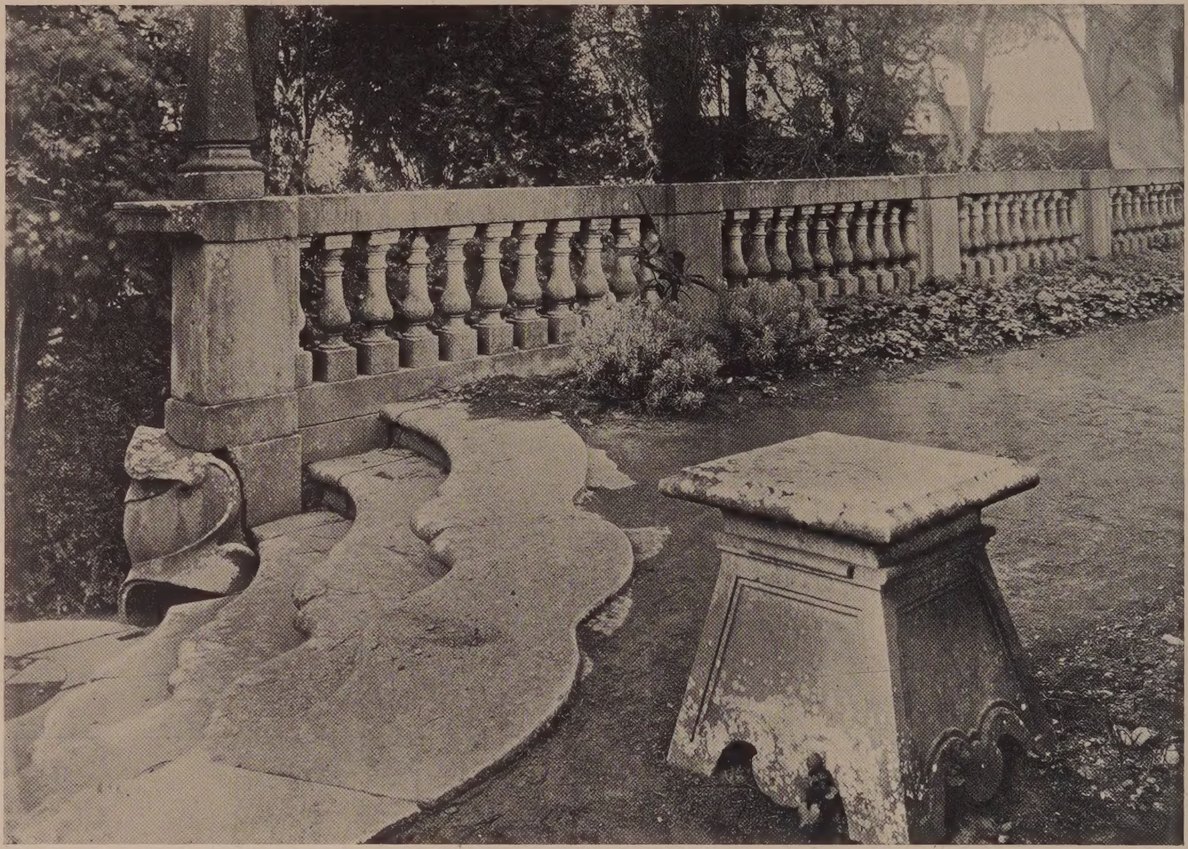

THE PAPAL VILLA OF CASTEL GANDALFO, NEAR ROME. BALUSTRADE AND STEPS.

Each room had a floor of two thicknesses of ⅞-inch floor-boards, with *two* thicknesses of Cabot's sheathing quilt between the floor-boards and the concrete slab of the main floor. On one side of each room was a door with a glass panel, the door-jambs being faced with soft felt, and the bottom of the door was fitted with a stop or "weather strip," operated when the door closed, making a tight joint at the bottom.

The side with the door will be referred to as the front in the following description:

Room A—This room was submitted by the National Fireproofing Company, and its four sides were made of terra-cotta blocks. The front and back walls were made of blocks four inches thick; the sides of two-inch and three-inch blocks. After the blocks were in position the room was given two coats of plaster inside and out.

Room B was submitted by the Keystone Block Company, and its four walls were made of the blocks of the Keystone material, of the nature of plaster of paris, with a fibrous bond. The front wall was of blocks four inches thick, and the left side was of blocks two inches thick, the back of blocks three inches thick, and the right side of two-inch blocks, with a two-inch air-space between them. The entire room was given two coats of plaster inside and out, except the front, which had no plaster on the outside of the blocks.

Room C was submitted by the Sackett Wall Board Company, and was built of Sackett plaster board one-quarter inch thick, wired upon both sides of three-inch steel channels. The channel truss or studs of the back and right side were wrapped with felt about one-eight inch in thickness before applying the plaster board. The Sackett plaster board is a composite board of alternate layers of paper and plaster, the whole being about one-quarter inch thick. This room, like the other, was plastered inside and out, but to a slightly less thickness.

Room D was submitted by J. Russell & Co., and was of a more complex construction. The left side was a solid partition of metallic lath and plaster. The seven-eighth-inch steel ties were spaced sixteen inches on centers, metal lath was applied to one side only of the ties, and then plastered to a thickness of two inches. The rear wall was built upon two rows of seven-eight-inch studs staggered. Between them were placed one thickness of waterproof paper about 1-32 inch thick, and metal lath was wired to both sides of the row of studs and given two coats of plaster. The right side was of the same construction, with a layer of one-eighth-inch felt between the two thicknesses of waterproof paper. The front wall was of metal lath on two rows of staggered studs, with Cabot's seaweed quilt between the row of studs.

Room E was submitted by Mr. Samuel Cabot, and was wholly of metal lath and plaster double partitions, with the space between the lath filled with Cabot's sheathing quilt. The front and left sides contained three thicknesses of quilt, and the right side and rear two thicknesses. The quilt was placed between the studs and the metal lath, and where three thicknesses were used, one was between the rows of studs as well.

The rooms had been vigorously dried for several days, none longer than a week, but the whole building was so damp and the

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time so short that no considerable part of the plaster and none of the interior portions of the partition were dry. The Sackett board room was the driest and Cabot's was the least dry.

The preliminary trials showed so great a range of efficiency of the several constructions that the microphonic apparatus, which was designed to make rapid comparisons of sound-intensity possible, could not be used. Reliance had to be placed wholly on listening with and without a felt-mouthed stethoscope at the outside of the partition to sounds of various quality and intensity from within. The notes of the piano, violin, cornet and the human voice were carefully tried throughout wide ranges of pitch and intensity. The performers and the instruments were interchanged; every possible chance of unfairness, due to the variations of intensity in the sounds used, was eliminated. Of course, no interchange of the positions of the room was possible. No electrically-driven tuning-fork could be used for producing sounds of constant loudness. The insulating property of some of the partitions was so good that not even the blare of a cornet or the overpowering tones of an Italian tenor, drawn from the ranks of the laborers on the building could be heard through the partition, except by careful listening within a few inches of the wall.

After much consideration, the writer has given the following ratings to the different partitions. The order of their standing upon the list indicates their efficiency as compared with those above and below them.

No.	Room.	Side.	Scale.	Composition.
1	E	Left	100	Cabot's Quilt, 3 thick + metal lath.
2	E	Right	95	“ “ 2 “ + “ “
3	E	Rear	95	“ “ 2 “ + “ “
4	C	Rear	85	Plaster Board, 2 felt on [s.
5	C	Left	85	“ “ 2 “ “ [.
6	C	Right	80	“ “ 2 “
7	D	Rear	75	Metal lath + paper.
8	D	Right	75	“ “ “ + felt.
9	B	Right	60	Two 2″ Keystone Block with 2″ air space.
10	A	Rear	50	4″ Terra Cotta Blocks.
11	B	Rear	50	3″ Keystone Blocks.
12	A	Right	45	3″ Terra Cotta Blocks.
13	B	Left	40	2″ Keystone Blocks.
14	A	Left	40	2″ Terra Cotta Blocks.
15	D	Left	30	2″ Metal lath, solid plaster.

Nothing more is to be inferred from the numerical efficiencies than that the first partition is about three times as good as the last, and that the numerical interval between any two partitions on the list merely indicates the order of magnitude of the difference between the partitions.

The partitions making up the rooms submitted by Samuel Cabot and the Sackett Wall Board Company were the most efficient; but it is distinctly to be borne in mind that no other room had so easy a test as did these, in that each of the others had one thin and ineffective side which transmitted sound to the sides adjacent to it. The thin side of the Keystone room was noticeably resonant, and plainly rendered it impossible to make a fully satisfactory test of the air-space partition. The solid metal lath plaster partition of the room submitted by J. Russell & Co., acted in the same way in that room.

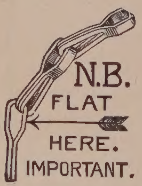
I do not believe, however, that this defect in the structures has caused any changes in the position on the efficiency list of the Cabot and Sackett rooms.

I would therefore give as my opinion that the best acoustic results would be obtained by using a partition of Sackett board and plaster, with two thicknesses of Cabot's quilt between the plaster board.

I should recommend a wooden stud rather than steel channels, if the fire risk is not materially increased thereby.

As later tests showed, some sort of a suspended ceiling will be needed, as the concrete slab transmits the sound across the top of the partition readily. No trouble will be given by the sound passing through the concrete to the rooms above or below; but, unless a layer of Cabot's quilt, with under-lath and plaster, or of Sackett board and plaster, be put on the under side of the concrete ceiling, the efficiency of the partitions will be diminished somewhat.

The front walls could not be tested because of the leaks around the door and through the door frames, even where covered with a large shutter padded with Cabot's quilt. It is evident that a double glass door will be needed. The floor construction is acoustically good.



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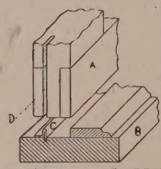

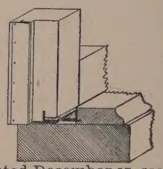

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